

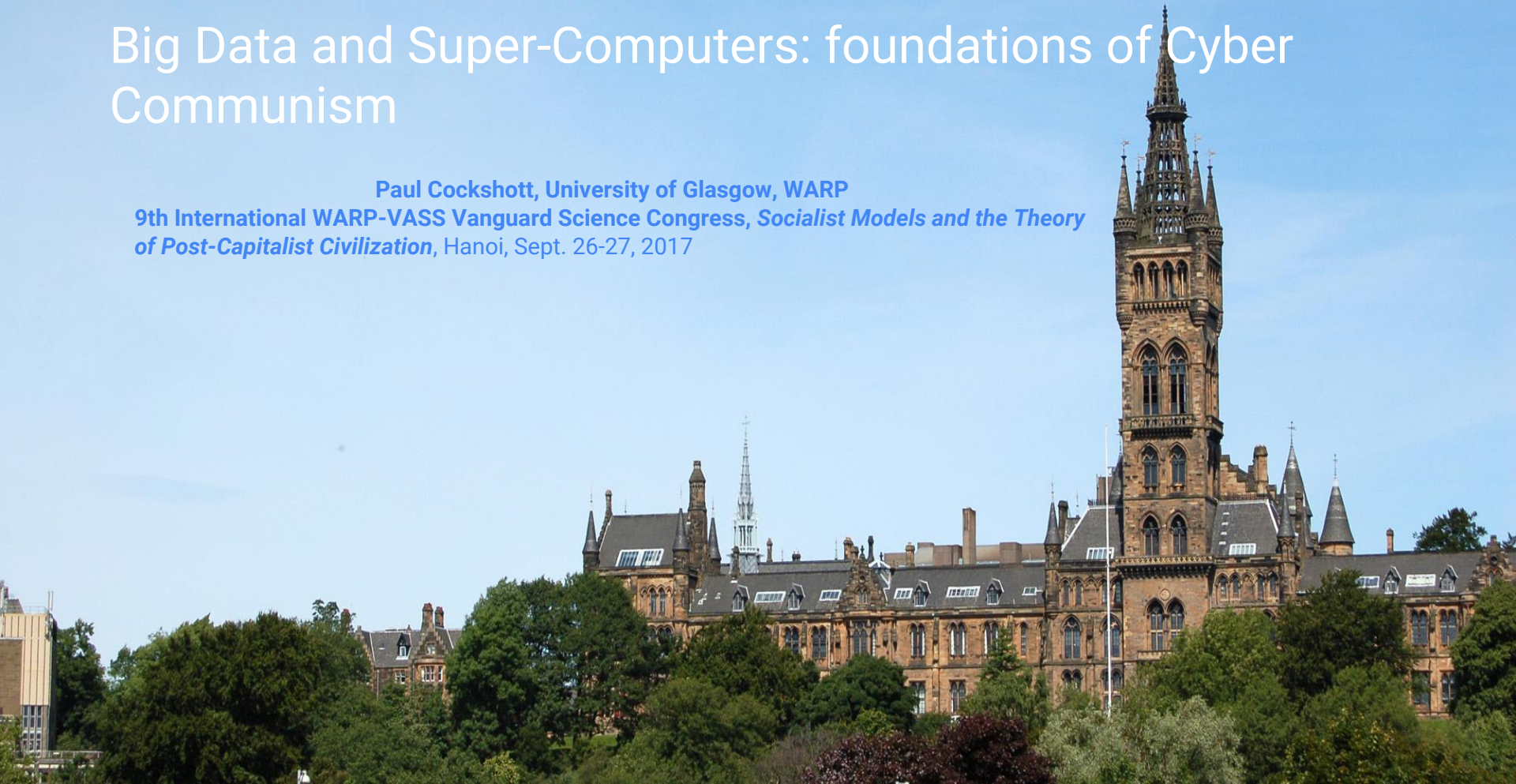


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Big Data and Super-Computers: foundations of Cyber Communism

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The fundamental thesis of Marxism

In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life.

(Marx 1857)



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- The inability of 20th century socialism to progress to communism led to the crisis of the USSR.
- Communism requires a definite stage of development of technology.
- This stage was only reached at the very end of the 20th century.



What is a mode of production

the productive forces are only one aspect of production, only one aspect of the mode of production, an aspect that expresses the relation of men to the objects and forces of nature which they make use of for the production of material values. Another aspect of production, another aspect of the mode of production, is the relation of men to each other in the process of production, men's relations of production.

(Stalin 1938)



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Mode of production = productive forces + production relations ?

NO

This has been the orthodoxy, but it is wrong.

A mode of production is, according to Marx, the mode of material production.

This mode of production, according to Marx, “conditions” the social and political life. The relations of production only have to be “appropriate” to the productive forces.



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The hand mill gives you society with the feudal lord; the steam mill, society with the industrial capitalist. (Marx 1847)

CAPITALISM

Capitalist mode of material production =
powered machine industry.



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Capitalist mode of material production =
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SOCIALISM

Socialist mode of material production = electric
powered machine industry.

Soviet power + Electrification (Lenin)

Important point is that capitalism and socialism *share the same mode of production*

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Capitalist mode of material production =
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Capitalist production relations =

Commodity production +

Private ownership +

Wage labour+

Market anarchy

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Socialist production relations =

Commodity form of consumer goods+

Public ownership +

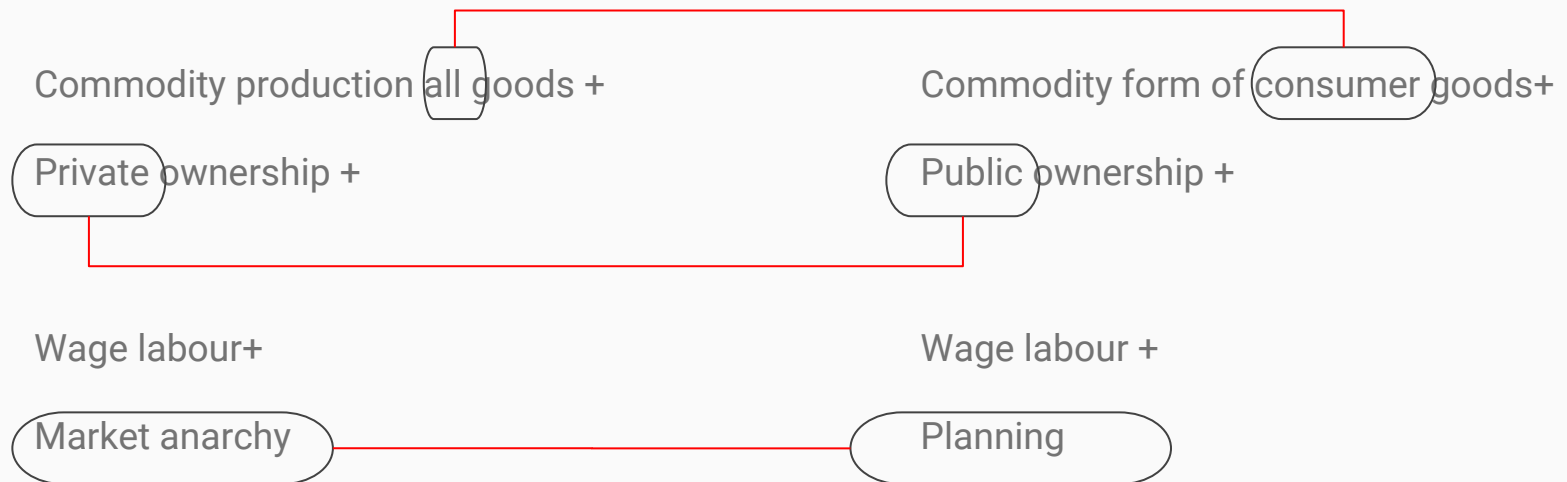
Wage labour +

Planning

Socialism vs capitalism (real historical experience not apriorism)

CAPITALISM

SOCIALISM





Marx vs Soviets on Communism

Marx

1. Capitalism
2. First stage communism

No commodities or money, no private owners, payment in labour tokens according to physical work done

Tax on labour incomes

Soviet theory

1. Capitalism



Marx vs Soviets on Communism

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Soviet theory

1. Capitalism
2. Socialism

Commodities and money are kept, state+coop ownership, payment in money wages according to work done and status of work (male jobs paid more than female)

Tax on sales



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3. Second stage communism

Payment according to need, large families etc get higher incomes

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Commodity production replaced by barter, free distribution of many goods, full state ownership



Why did USSR not reach communism?

The material and technical basis of communism will be built up by the end of the second decade (1971-80), ensuring an abundance of material and cultural values for the whole population ; Soviet society will come close to a stage where it can introduce the principle of distribution according to needs, and there will be a gradual transition to one form of ownership-public ownership . Thus, a communist society will in the main be built in the U.S.S.R . The construction of communist society will be fully completed in the subsequent period.

(Programme CPSU 1960)

1. Very optimistic time table for overtaking US, but in many key industries it was achieved.
2. Transition seen solely in terms of quantity of output not in terms of changed social relations.
3. Key technical development seen as electrification: *"Electrification, which is the pivot of the economic construction of communist society, plays a key role in the development of all economic branches and in the effecting of all modern technological progress. It is therefore important to ensure the priority development of electric power output."*



Soviet power as electric power

	year	Gwh	human labour equiv per head
China	2014	5665000	19.2
US	2014	4331000	63.1
EU	2014	3166000	19.7
USSR	1990	1728000	27.3
GB	2014	338000	24.8
GB	1907	61320	7.3

USSR had by 1990 overtaken the power per head available in the UK and the EU in 2014.

Was this enough power for communism?

Comparison of power available to different economies converted into human labour effort equivalents per head of population. Assumption is that a manual worker could do 216 KWh per year of work.



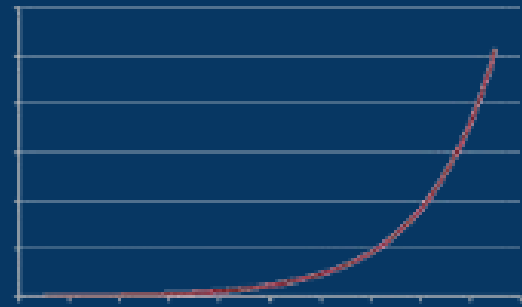
Comparative food production



	per head per year	
Brazil	163	eggs
United Kingdom	201	eggs
USSR	294	eggs
Brazil	96	ltr milk
United Kingdom	265	ltr milk
USSR	372	ltr milk
Brazil	49	kg meat
United Kingdom	55	kg meat
USSR	68	kg meat

Comparison of Soviet with UK and Brazil annual per capita output of major protein foods(1988). Note that for all categories the late USSR had better figures than both the UK a leading capitalist country and Brazil which was at the same level of development as the USSR in 1917. Sources Pockney,FAOSTAT and USDA databases.

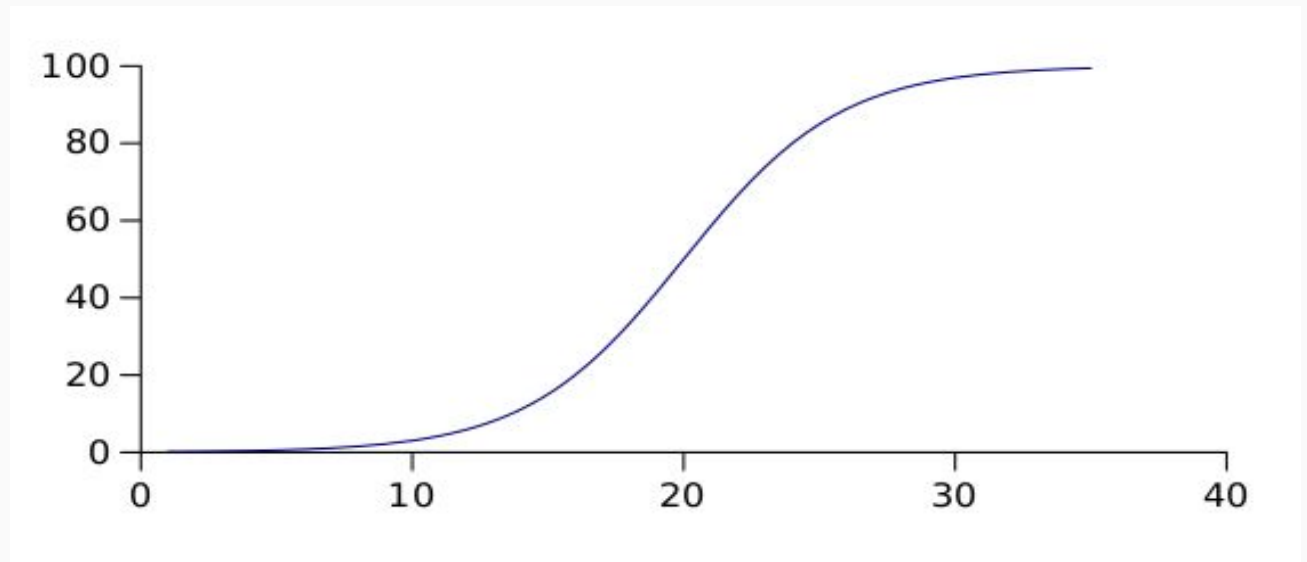
Was this enough food for communism?



Kruschev's Communism assumed exponential growth

The assumption of exponential growth was unrealistic. Actual growth can not be exponential for long, it inevitably starts to slow down.

Actual growth follows S curve

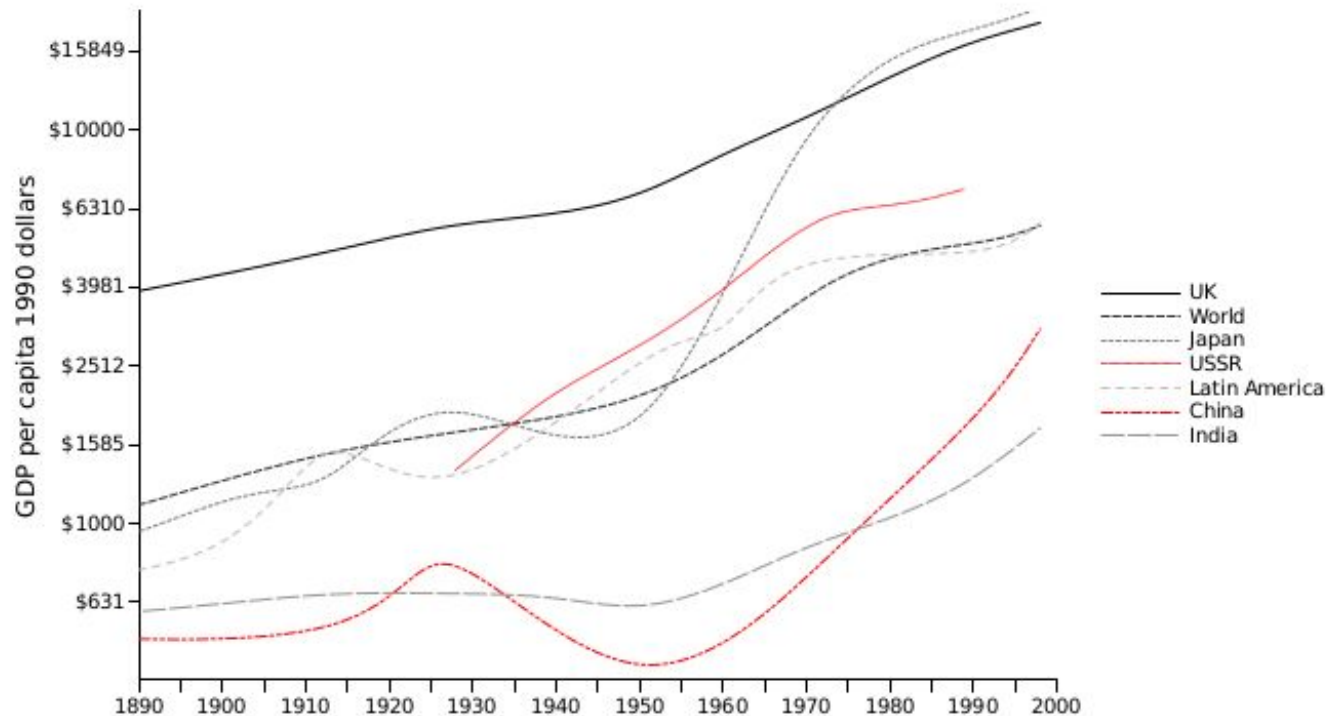


Kruschev's Communism assumed exponential growth

Slowdown produced by the full absorption of the rural population into industry.

Early stages of the S curve look like rapid exponential growth.

S curve for big economies





Khrushchev's Communism downplayed social change

Under communism there will be no classes, and the socio-economic and cultural distinctions, and differences in living conditions, between town and countryside will disappear ; the countryside will rise to the level of the town in the development of the productive forces and the nature of work, the forms of production relations, living conditions and the well-being of the population.

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When the impossibility of continued 10% growth made itself felt, this was seen as the failure of communism, since social change had not been at its core.

If society was not moving forward, it failed to morally inspire people and by the late 1980s communists could not resist the pressures from capitalist ideology.



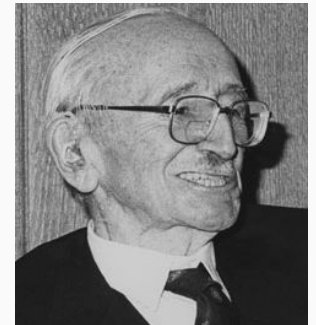
Bourgeois theorists said Communism impossible

Von Mises



- Only money provides a rational basis for comparing costs
- Calculation in terms of labour time impractical because of the millions of equations that would need to be solved.

Hayek



- Market is like a telephone system exchanging information to tie up economy
- Only the market can solve problem of dispersed information



Marx's communism was not yet possible in 1960

Marx's Communism stage 1

- No money
- Calculation in terms of labour time and use values
- Payment in labour credits

But to work out the labour content of every good required the solution of millions of equations.

1960s computers not powerful enough.

Soviet Socialism

- Money still needed for economic calculation even in the planned sector.
- Problem of aggregation in planning required monetary objectives
- Inability to handle disaggregated plans at all Union level.
- Money still needed for wage payments

But cash led to black markets, corruption and pressure to restore capitalist relations.



Key developments in productive forces since 1960

1. Internet
2. Giant databases
3. Super computers
4. Electronic payment cards

1. Internet allows real-time cybernetic planning and can solve the problem of dispersed information - Hayeks key objection
2. Big data allows concentration of the information needed for planning.
3. Super computers can solve the millions of equations in seconds - von Mises objection
4. Electronic payment cards allow replacement of cash with non transferable labour credits.

Computational complexity

How easy is it to solve the millions of equations.

There are some problems that become computationally intractable even for the largest computers.

Is economic planning or the use of labour accounting like that.

NO!

In a series of papers, Allin Cottrell, Greg Michaelson and I have shown that the computational complexity of computing labour values for an entire economy with N distinct products grows as

$N \log(N)$

This means that it is highly tractable and easily solved by modern computers

Essentials of cyber communism

Direct democracy

Major strategic decisions taken democratically

- How much labour to devote to education
- How much to health, pensions, sick
- How much to environmental protection
- How much to national defence
- How much to new investment

All this can be done by direct voting using computers or mobile phones every year. We have prototyped software to aggregate the wishes of the public this way. (Google Handivote)

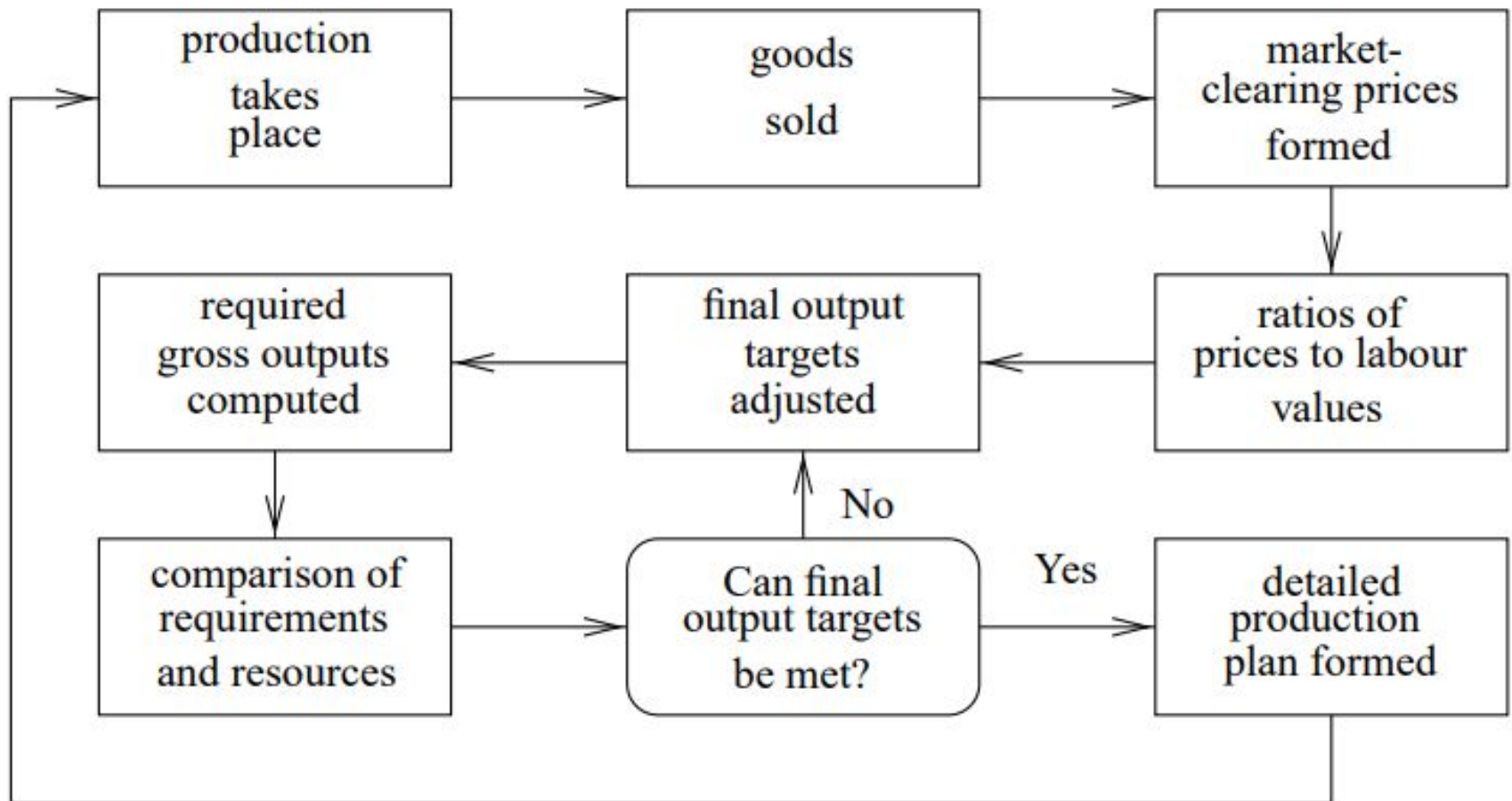
Equivalence Economy

Marx's principle that non-public goods are distributed on the equivalence principle - you get back in goods the same amount of labour - after tax - that you perform.

Hence goods are priced in labour hours.

Cybernetic feedback from sales to the plan to adjust output to consumer needs.

Overall cybernetic structure





Communist efficiency

Marx argued that calculation in terms of labour time would lead to greater efficiency.

The wages system undervalues the real social cost of labour and deters the use of the most modern machinery.

Transition to communist calculation will lead to the rational use of labour time, and faster growth of labour productivity.

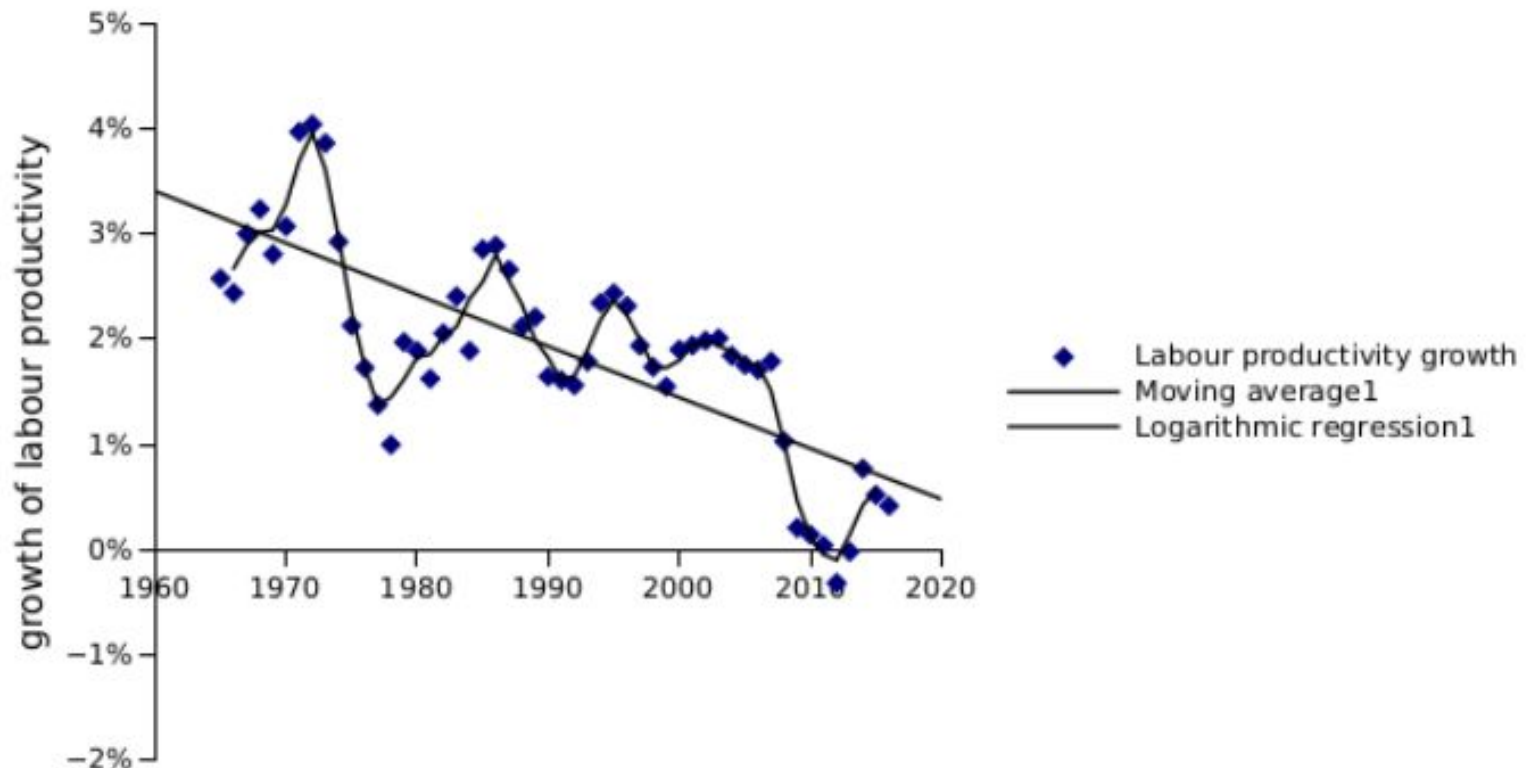
Throughout the capitalist world this law is in effect, slowing down the growth of labour productivity.

The capitalist class seek cheap labour, which systematically holds back technical progress.

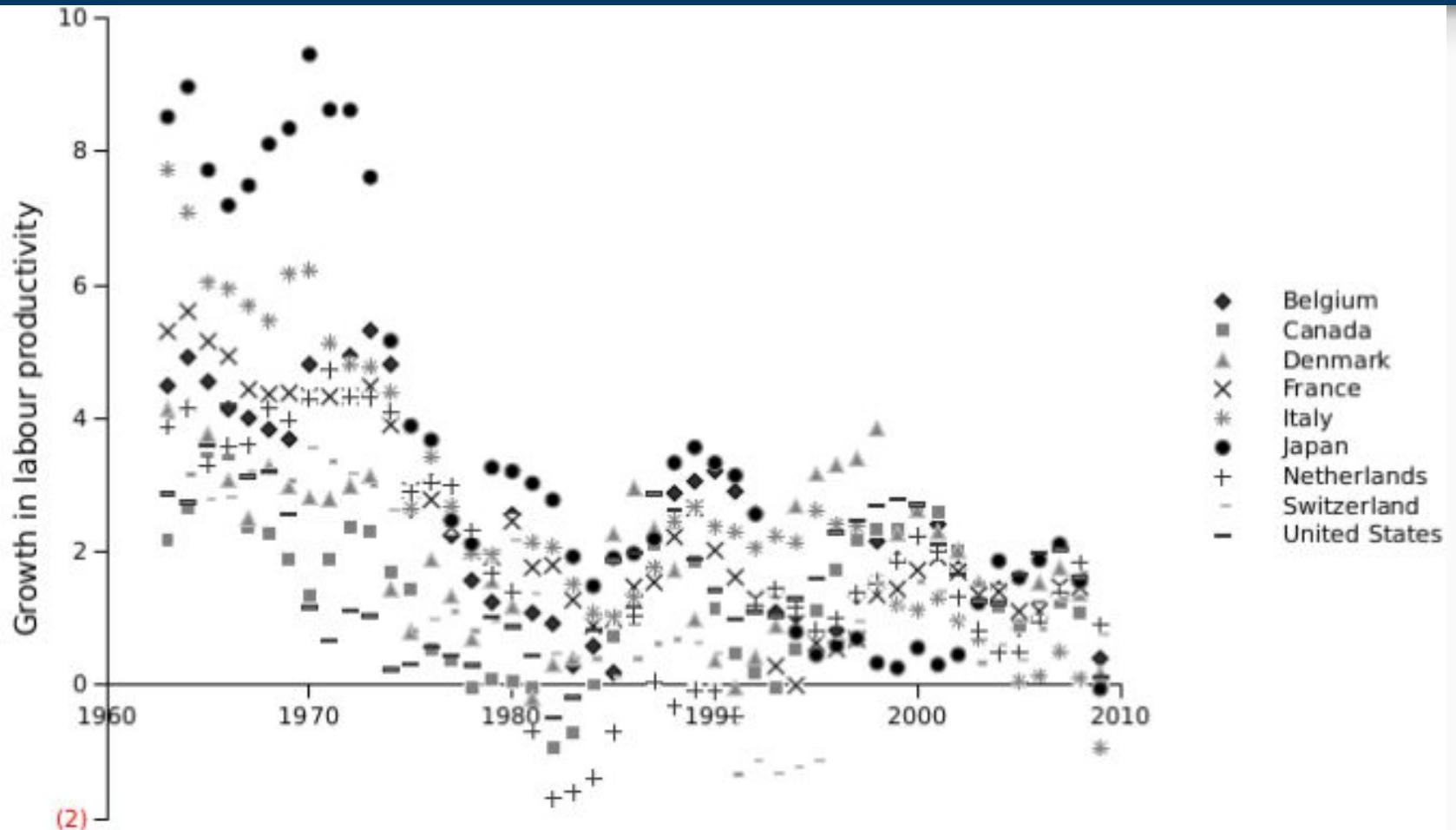
They show chronic unwillingness to invest.

Orthodox economists call this 'secular stagnation'.

Labour productivity growth slows in UK



Whole capitalist system slowing down





Transition steps to first stage of communism

Preparatory steps

1. Monetary unit converted to the labour hour set at the average value created per hour.
- 2.

During the preparation, commodity exchange between enterprises still exists, and monetary transactions still possible, but exploitation is eliminated.



Transition steps to first stage of communism

Preparatory steps

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2. Move from state funding from profits of state enterprises to state entirely funded by progressive income tax.
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3. Legislation to give employees right -before tax to full value created in enterprise
- 4.

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4. Conversion of remaining private firms to cooperatives
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5. **Develop centralised internet system to track all purchases and sales.**
- 6.

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3. Legislation to give employees right -before tax to full value created in enterprise
4. Conversion of remaining private firms to cooperatives
5. Develop centralised internet system to track all purchases and sales.
6. **Withdraw all paper money and coins, replace with electronic cards**

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Building first stage of communism

Preparatory steps

1. Monetary unit converted to the labour hour set at the average value created per hour.
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In the next stages

1. Private circulation of money eliminated, and money only used by consumers to purchase final goods from public stores.
- 2.



Reinforcing first stage of communism

Preparatory steps

1. Monetary unit converted to the labour hour set at the average value created per hour.
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In the next stages

1. Private circulation of money eliminated, and money only used by consumers to purchase final goods from public stores.
2. Commodity exchange between enterprises replaced by computerised directive planning
- 3.



Arrive first stage of communism

Preparatory steps

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In the next stages

1. Private circulation of money eliminated, and money only used by consumers to purchase final goods from public stores.
2. Commodity exchange between enterprises replaced by computerised directive planning
3. **Equalisation of pay rates between men and women and between different professions and trades.**



Summary

- Technical advance on a world scale held back by the wages system.
- Contradiction between the social relations of capitalism and the potential of the new productive forces.
- The new technology permits direct transition to communist mode of calculation.
- The new relations of production will abolish class differences and allow progress to resume.

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